



**Greater New Haven Water Pollution Control Authority**

260 East Street New Haven, CT 06511  
203.466.5280 p 203 772.1564 f [www.gnhwpca.com](http://www.gnhwpca.com)

June 13, 2012

Via Federal Express

United States Environmental Protection Agency  
New England Region  
5 Post Office Square, Suite 100 (OES 04-03)  
Boston, MA 02109-3912  
Attn: Michael Fedak

Connecticut Department of Energy and Environmental Protection  
Municipal Facilities, Planning & Standards  
Water Protection and Land Use  
79 Elm Street  
Hartford, CT 06106-5127  
Attn: George Hicks

Re: Response of the Greater New Haven Water Pollution Control Authority  
USEPA Request for Information, February 14, 2012 – Question VII

Dear Mr. Fedak and Mr. Hicks:

Please find enclosed the CSO Flow Monitoring Plan which completes our response to Question VII of the February 14, 2012 information request issued by the United States Environmental Protection Agency (USEPA) to the Greater New Haven Water Pollution Control Authority (GNHWPCA) pursuant to the Clean Water Act Section 308(a); 33 U.S.C. § 1318(a).

As always, we are available to discuss any of these items as you conduct your review.

Sincerely,

The Greater New Haven Water Pollution Control Authority

Mr. Sidney J. Holbrook  
Executive Director

Greater New Haven Water Pollution Control Authority

Response to Question VI, USEPA Information Request Dated February 14, 2012

Statement of Certification

I declare under penalty of perjury that I am authorized to respond on behalf of the Greater New Haven Water Pollution Control Authority, of New Haven, Connecticut. I certify that the foregoing responses and information submitted were prepared under my direction or supervision and that I have personal knowledge of all matters set forth in the responses and the accompanying information. I certify that the responses are true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment.

By \_\_\_\_\_

(Signature)

\_\_\_\_\_  
Sidney J. Holbrook

(Printed Name)

\_\_\_\_\_  
Executive Director

(Title)

\_\_\_\_\_  
June 13, 2012

(Date)

**GREATER NEW HAVEN WPCA  
CSO FLOW MONITORING PLAN  
JUNE 13, 2012**

**INTRODUCTION**

The USEPA Request for Information dated February 14, 2012 required the GNHWPCA to submit a plan to install continuous monitoring devices to quantify and record the discharges from those CSO locations that are currently not continuously monitored. The plan was to include the installation of the meters by December 31, 2012. Upon installation and calibration of the flow meters, the GNHWPCA is requested to submit an annual listing of the discharges from its CSO outfalls to the DEEP and USEPA no later than February 15, 2013 that includes the following:

- Activation frequency and discharge volume for each CSO organized chronologically, by outfall;
- Daily precipitation records including total rainfall and peak intensity

**BACKGROUND**

This background information was included in the April 12, 2012 Response to USEPA RFI. It is being repeated here so that this CSO Flow Monitoring Plan can be reviewed as a standalone document by USEPA and DEEP.

When the GNHWPCA came into existence in August 2005, none of the 23 active CSOs were continuously metered. In January, 2007, the GNHWPCA hired CDM as a design/build Contractor to construct a concrete chamber and install a permanent meter at CSO 024. The cost to design and construct the permanent meter installation at CSO 024 was \$127,500. In October, 2007, CDM was tasked with designing and constructing permanent meter installations at the remaining active CSOs along the Boulevard Interceptor (CSO 003, CSO 004, CSO 005, and CSO 006) at an estimated cost of \$1,255,500. All of this work was funded by DEEP as an integral part of implementation of the CSO Long Term Control Plan approved by DEEP in 2003.

Problems arose in 2008 and 2009 with the maintenance required at the permanent installation at CSO 024 and the suspect quality of the data being recorded. As design of the permanent installations at CSO 003, CSO 004, CSO 005 and CSO 006 proceeded it became apparent that there were problems related to the equipment selected and the means of communication with the ESWPAF. It also became apparent that there were more cost effective options available that had not been investigated. On July 27, 2009, DEEP approved an Amendment to CDM's contract to prepare an evaluation of options to meter the Boulevard Interceptor CSOs. CDM completed the report on April 13, 2010. Although the



report did not provide recommendations it did provide GNHWPCA with all the necessary information to plan the best approach to move forward with a plan to meter CSOs along the Boulevard Interceptor.

Consistent with and informed by the above data, GNHWPCA submitted a plan to DEEP to provide continuous flow monitoring for all CSOs along the Boulevard Interceptor on April 15, 2010. The plan proposed the installation of continuous flow monitoring devices within existing structures that included cell phone communication technology to record activation frequency and discharge volume. The proposed plan also included a rain gauge to record total rainfall and peak intensity. This approach is preferred by the GNHWPCA over the construction of permanent meter installations (similar to CSO 024) because it provides proven reliability at significantly lower capital and O&M costs.

An extension request to provide a plan to install continuous monitoring devices at the remaining active CSOs in the Collection System by June 15, 2012 was submitted to USEPA on March 29, 2012. This CSO Flow Monitoring Plan supersedes the April 15, 2010 plan and provides a full and complete response to all of the items requested pursuant to Question VII of the USEPA RFI dated February 14, 2012.

### **ACTIVE CSOs**

The 23 active and 14 closed CSOs in the GNHWPCA Collection System along with the locations of the Boulevard Pump Station, East Street Pump Station, James Street Siphon and the ESWPCF are shown on Figure 1. Table 1 was developed from data contained in the Long Term Control Plan CSO status report and the Hydraulic Model Update for each of the 23 active CSOs in the Collection System (CSO 001 is located at the ESWPAF and is continuously monitored). Table 1 includes the CSO number, whether the CSO is tributary to the Boulevard Pump Station, East Street Pump Station, James Street Siphon or the ESWPCF, the receiving water that the CSO discharges to, hydraulic model estimates of overflow volumes during the two year storm and hydraulic model estimates of total overflow volume, numbers of CSOs, and duration of CSOs during a typical year. Approximately one third of the dry weather and wet weather flow is pumped to the ESWPCF by the Boulevard Pump Station and an additional one third is pumped to the ESWPCF by the East Street Pump Station.

Table 2 contains the same data as Table 1 but has been sorted based on whether the CSO is tributary to the Boulevard Pump Station, East Street Pump Station, James Street Siphon or the ESWPCF. Based on output from the hydraulic model, CSOs which are tributary to the Boulevard Pump Station (CSO 003, CSO 004, CSO 005, CSO 006, CSO 008 and CSO 024) discharge 19.9 million gallons (MG) during a two year storm, or about 40% of the total discharge during the two year storm. During a typical year (determined to be 1967 in the Long Term CSO Control Plan), CSOs tributary to the Boulevard Pump Station discharge about 53% of the total volume of CSOs. These CSOs activate frequently and stay active longer than most CSOs in the GNHWPCA Collection System as shown in Table 2. Each of these CSOs is located along the Boulevard Interceptor (which was constructed between 1885 and 1917) and discharge to the Boulevard Pump Station (which replaced the Boulevard treatment plant in 1986). The 5 MG Truman CSO Storage Tank was constructed along the Boulevard Interceptor in 2006.

## **CSO FLOW MONITORING PLAN – BOULEVARD PUMP STATION TRIBUTARY AREA**

In order to satisfy the USEPA RFI CSO flow monitoring program in the Boulevard Pump Station tributary area, GNHWPCA would need to install a continuous flow meter in the overflow pipe at CSO 008, CSO 006, CSO 005, CSO 004, and CSO 003. The CSO at 024 is currently continuously monitored.

GNHWPCA is moving forward to implement a far more comprehensive CSO flow monitoring program in the Boulevard Pump Station tributary area. The goal of the more comprehensive approach is to install additional meters in the collection system to gain a thorough understanding of how the collection system is operating so as to be able to take advantage of low cost operational changes that will reduce CSO frequency, duration and volume. CSO 008 was not included in the plan because of its location in the collection system and the small CSO volume predicted by the hydraulic model (0.2 MG in the 2 year storm and 0.0 MG during a typical year). Existing flow control devices along the Boulevard Interceptor include;

- Boulevard Pump Station
  - Wetwell pump on and off levels
  - Pump capacities
  - Flow control sluice gate
- CSO 024 Chamber overflow weir elevation
- Truman Tank
  - Bending weir elevation
  - Discharge pump on level
- CSO 003 weir elevation
- CSO 004 weir elevation
- CSO 005 overflow configuration
- CSO 006 adverse pipe slope elevation

GNHWPCA selected CSL Services, Inc. to provide the following services;

- Furnish and install continuous flow monitoring devices at the following locations along the Boulevard Interceptor (CSL Site Investigation Forms are attached)
  - CSO 006 interceptor
  - CSO 006 overflow A
  - CSO 006 overflow B
  - CSO 005 interceptor
  - CSO 005 overflow
  - CSO 004 interceptor
  - CSO 004 overflow
  - CSO 003 interceptor
  - CSO 003 overflow



- Truman Tank interceptor
- CSO 024 interceptor is currently continuously monitored
- CSO 024 overflow
- Furnish and install a rain gauge at the Boulevard Pump Station
- Monitor and maintain all of the equipment for at least one year
- Verify the accuracy and reliability of the data on a continuous basis
- Make the data available to the GNHWPCA via the project website within 24 hours
- Provide monthly reports to the GNHWPCA that summarize
  - Activation frequency and discharge volume at each CSO
  - Daily precipitation records including total rainfall and peak intensity

In accordance with the USEPA RFI, GNHWPCA will submit a listing of discharges to DEEP and USEPA on February 15, 2013. GNHWPCA proposes to submit subsequent annual listings of discharges to DEEP and USEPA on June 30<sup>th</sup> of each year (beginning in 2013) coincident with the Annual Progress Report required by the Consent Order dated July 1, 2009.

The cost to furnish and install the 11 flow meters and the rain gauge was \$82,000. The meters were installed on June 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup>, 2012. The life expectancy of the equipment is between 5 and 7 years if properly maintained. GNHWPCA funded this equipment purchase and installation using Authority funds. However, we are hopeful that these costs would be eligible for reimbursement from the Clean Water Fund (as was the case for the flow meter installed at CSO 024 in 2008 and the aborted 2009 plan to install permanent flow meters at CSO 006, CSO 005, CSO 004, and CSO 003).

The cost to monitor, maintain and provide accurate data to the Authority is \$66,000 per year. GNHWPCA understands that this is an operational expense that is not eligible for reimbursement under the Clean Water Fund.

#### **CSO FLOW MONITORING PLAN – OTHER MAJOR CSOs**

Based on the hydraulic model output contained in Tables 3 and 4 (which has been sorted by 2 year storm CSO volume and typical year CSO volume, respectively), the next 10 largest CSOs in the GNHWPCA Collection System are located at CSO 011, CSO 021, CSO 016, CSO 009, CSO 025, CSO 015, CSO 012, CSO 019, CSO 014, and CSO 010. Since the CSO at Greene Street was discovered after the model was constructed we propose to monitor the Greene Street CSO as part of the Other Major CSOs Program. The CSOs included in the Boulevard Pump Station Tributary Area are shown in orange on Tables 3 and 4. The other major CSOs included in this phase of the plan are shown in yellow on Tables 3 and 4. Together with the CSOs that are tributary to the Boulevard Pump Station, the overflow volume from these 11 CSOs represents about 95% of the total CSO volume during a two year storm and 99% of the volume during a typical year according to the hydraulic model.

The cost to furnish and install the additional 11 flow meters is \$78,100. The meters are scheduled to be installed before December 2012. The life expectancy of the equipment is between 5 and 7 years if properly maintained. GNHWPCA is moving forward to fund this equipment purchase and installation using Authority funds. However, we are hopeful that these costs would be eligible for reimbursement from the Clean Water Fund (as was the case for the flow meter at CSO 024 in 2008 and the aborted 2009 plan to install permanent flow meters at CSO 006, CSO 005, CSO 004, and CSO 003).

The cost to monitor, maintain and provide accurate data to the Authority from the additional 11 meters is \$60,700 per year. GNHWPCA understands that this is an operational expense that is not eligible for reimbursement under the Clean Water Fund.

#### **CSO FLOW MONITORING PLAN – FUTURE PHASES**

Once the CSO Flow Monitoring Plan in the Boulevard Pump Station tributary area has been completed and the system has been optimized to minimize CSOs, the flow meters at CSO 003, CSO 004, CSO 005, CSO 006 and CSO 024 will remain in service. The additional 7 flow meters can either be moved to the remaining minor CSOs (CSO 034, CSO 020, CSO 008, CSO 013, CSO 026, CSO 028, and CSO 032), which represent only 5% of the total CSO volume during a two year storm and 1% of the volume during a typical year, or they could be used to optimize the CSOs tributary to the East Street Pump Station or the James Street Siphon. The minor CSOs are not highlighted in Tables 3 and 4.

TABLE 1  
GREATER NEW HAVEN WPCA  
CSO FLOW MONITORING PLAN  
ACTIVE CSOs  
SORTED BY CSO NUMBER

2007 EXISTING CONDITIONS MODEL OUTPUT FOR CSOs						
<u>CSO</u> <u>NUMBER</u>	<u>TRIBUTARY</u> <u>TO</u>	<u>RECEIVING</u> <u>WATER</u>	<u>2 YEAR</u> <u>STORM</u>	<u>TYPICAL YEAR (1967)</u>		
			<u>VOLUME (MG)</u>	<u>VOLUME (MG)</u>	<u>NUMBER</u>	<u>DURATION (HRS)</u>
CSO 003	Boulevard Pump Station	West River	3.1	12.5	28	96
CSO 004	Boulevard Pump Station	West River	6.1	65.3	44	282
CSO 005	Boulevard Pump Station	West River	4.8	22.0	39	196
CSO 006	Boulevard Pump Station	West River	5.1	27.0	27	82
CSO 008	Boulevard Pump Station	Mill River	0.2	0.0	0	0
CSO 009	James Street Siphon	Mill River	2.5	8.1	27	66
CSO 010	East Street Pump Station	Mill River	0.9	2.4	6	11
CSO 011	East Street Pump Station	Mill River	7.4	26.6	15	55
CSO 012	East Street Pump Station	Mill River	1.5	2.9	8	24
CSO 013	East Street Pump Station	Mill River	0.1	0.4	1	0
CSO 014	East Street Pump Station	Mill River	1.0	1.2	1	1
CSO 015	James Street Siphon	Quinnipiac River	1.7	4.1	9	24
CSO 016	James Street Siphon	Quinnipiac River	3.8	20.4	45	157
CSO 019	James Street Siphon	Quinnipiac River	1.3	2.4	7	19
CSO 020	ESWPCF	Quinnipiac River	0.6	1.4	6	20
CSO 021	East Street Pump Station	New Haven Harbor	5.0	35.1	23	95
CSO 024	Boulevard Pump Station	New Haven Harbor	0.6	1.9	0	0
CSO 025	East Street Pump Station	New Haven Harbor	2.5	9.0	6	17
CSO 026	East Street Pump Station	Mill River	0.0	0.0	0	0
CSO 028	East Street Pump Station	Mill River	0.0	0.0	0	0
CSO 032	East Street Pump Station	New Haven Harbor	0.0	0.0	0	0
CSO 034	East Street Pump Station	New Haven Harbor	0.9	1.6	3	7
Greene Street	East Street Pump Station	New Haven Harbor	No Data	No Data	No Data	No Data
TOTAL			49.1	244.3		



TABLE 2  
GREATER NEW HAVEN WPCA  
CSO FLOW MONITORING PLAN  
ACTIVE CSOs  
SORTED BY TRIBUTARY TO

<u>2007 EXISTING CONDITIONS MODEL OUTPUT FOR CSOs</u>						
<u>CSO NUMBER</u>	<u>TRIBUTARY TO</u>	<u>RECEIVING WATER</u>	<u>2 YEAR</u>	<u>TYPICAL YEAR (1967)</u>		
			<u>STORM VOLUME (MG)</u>	<u>VOLUME (MG)</u>	<u>NUMBER</u>	<u>DURATION (HRS)</u>
CSO 003	Boulevard Pump Station	West River	3.1	12.5	28	96
CSO 004	Boulevard Pump Station	West River	6.1	65.3	44	282
CSO 005	Boulevard Pump Station	West River	4.8	22.0	39	196
CSO 006	Boulevard Pump Station	West River	5.1	27.0	27	82
CSO 008	Boulevard Pump Station	Mill River	0.2	0.0	0	0
CSO 024	Boulevard Pump Station	New Haven Harbor	0.6	1.9	0	0
SUBTOTAL			19.9	128.7		
CSO 010	East Street Pump Station	Mill River	0.9	2.4	6	11
CSO 011	East Street Pump Station	Mill River	7.4	26.6	15	55
CSO 012	East Street Pump Station	Mill River	1.5	2.9	8	24
CSO 013	East Street Pump Station	Mill River	0.1	0.4	1	0
CSO 014	East Street Pump Station	Mill River	1.0	1.2	1	1
CSO 021	East Street Pump Station	New Haven Harbor	5.0	35.1	23	95
CSO 025	East Street Pump Station	New Haven Harbor	2.5	9.0	6	17
CSO 026	East Street Pump Station	Mill River	0.0	0.0	0	0
CSO 028	East Street Pump Station	Mill River	0.0	0.0	0	0
CSO 032	East Street Pump Station	New Haven Harbor	0.0	0.0	0	0
CSO 034	East Street Pump Station	New Haven Harbor	0.9	1.6	3	7
Greene Street	East Street Pump Station	New Haven Harbor	No Data	No Data	No Data	No Data
SUBTOTAL			19.3	79.2		
CSO 020	ESWPCF	Quinnipiac River	0.6	1.4	6	20
CSO 009	James Street Siphon	Mill River	2.5	8.1	27	66
CSO 015	James Street Siphon	Quinnipiac River	1.7	4.1	9	24
CSO 016	James Street Siphon	Quinnipiac River	3.8	20.4	45	157
CSO 019	James Street Siphon	Quinnipiac River	1.3	2.4	7	19
SUBTOTAL			9.3	35.0		
TOTAL			49.1	244.3		



TABLE 4  
GREATER NEW HAVEN WPCA  
CSO FLOW MONITORING PLAN  
ACTIVE CSOs  
SORTED BY TYPICAL YEAR CSO VOLUME

2007 EXISTING CONDITIONS MODEL OUTPUT FOR CSOs						
<u>CSO NUMBER</u>	<u>TRIBUTARY TO</u>	<u>RECEIVING WATER</u>	<u>2 YEAR</u>	<u>TYPICAL YEAR (1967)</u>		
			<u>STORM VOLUME (MG)</u>	<u>VOLUME (MG)</u>	<u>NUMBER</u>	<u>DURATION (HRS)</u>
CSO 004	Boulevard Pump Station	West River	6.1	65.3	44	282
CSO 021	East Street Pump Station	New Haven Harbor	5.0	35.1	23	95
CSO 006	Boulevard Pump Station	West River	5.1	27.0	27	82
CSO 011	East Street Pump Station	Mill River	7.4	26.6	15	55
CSO 005	Boulevard Pump Station	West River	4.8	22.0	39	196
CSO 016	James Street Siphon	Quinnipiac River	3.8	20.4	45	157
CSO 003	Boulevard Pump Station	West River	3.1	12.5	28	96
CSO 025	East Street Pump Station	New Haven Harbor	2.5	9.0	6	17
CSO 009	James Street Siphon	Mill River	2.5	8.1	27	66
CSO 015	James Street Siphon	Quinnipiac River	1.7	4.1	9	24
CSO 012	East Street Pump Station	Mill River	1.5	2.9	8	24
CSO 019	James Street Siphon	Quinnipiac River	1.3	2.4	7	19
CSO 010	East Street Pump Station	Mill River	0.9	2.4	6	11
CSO 024	Boulevard Pump Station	New Haven Harbor	0.6	1.9	0	0
CSO 034	East Street Pump Station	New Haven Harbor	0.9	1.6	3	7
CSO 020	ESWPCF	Quinnipiac River	0.6	1.4	6	20
CSO 014	East Street Pump Station	Mill River	1.0	1.2	1	1
CSO 013	East Street Pump Station	Mill River	0.1	0.4	1	0
CSO 008	Boulevard Pump Station	Mill River	0.2	0.0	0	0
CSO 026	East Street Pump Station	Mill River	0.0	0.0	0	0
CSO 028	East Street Pump Station	Mill River	0.0	0.0	0	0
CSO 032	East Street Pump Station	New Haven Harbor	0.0	0.0	0	0
Greene Street	East Street Pump Station	New Haven Harbor	No Data	No Data	No Data	No Data
<b>TOTAL</b>			<b>49.1</b>	<b>244.3</b>		
	Included in the Boulevard Pump Station Tributary Area CSO Flow Monitoring Plan					
	Included in the Other Major CSOs Flow Monitoring Plan					

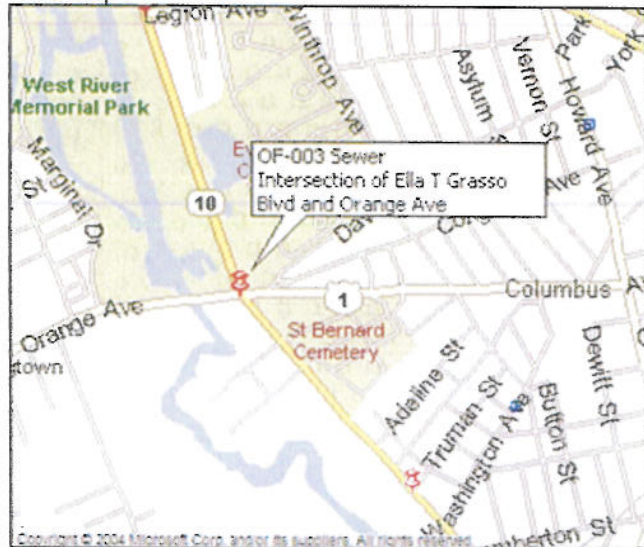


## SITE INVESTIGATION

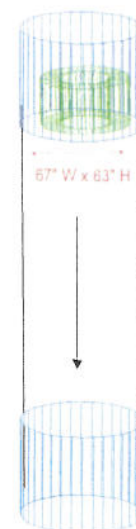
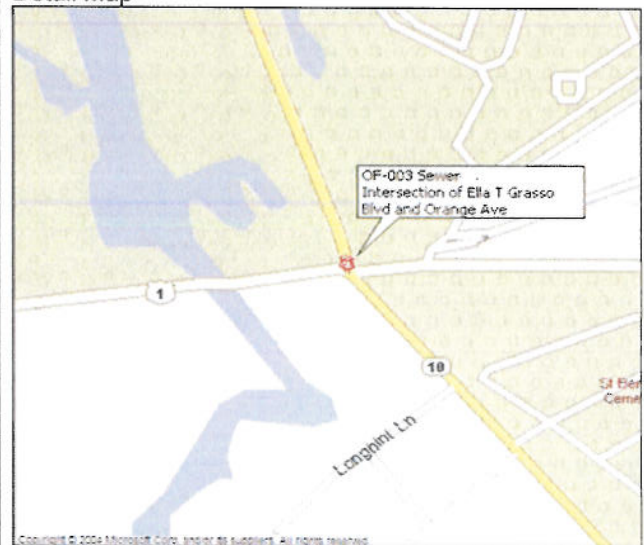
Project: New Haven Temporary Flow Metering Study	Date: 5/23/12	Name: L. Radico
Manhole #: OF-003 Sewer	Pipe Diameter: 67" W x 63" H	Time: 9:05
Address/Location: Intersection of Ella T. Grasso Boulevard & Orange Avenue		
Latitude: N 41°17.843'	Longitude: W 72° 56.926'	Access: Drive
Safety: Standard CSE, Chest waders needed		Manhole Depth: 6'8"
Gas Investigation: Good	Manhole Condition: Fair	Traffic: Police/Traffic control required
Sensor Configuration: Pressure Depth, Doppler Velocity		

Site Comments: Site is suitable for metering. Evidence of surcharge.	
Silt: 2"	
Depth: 32.5"	Velocity: 0.96 fps

Area Map



Detail Map



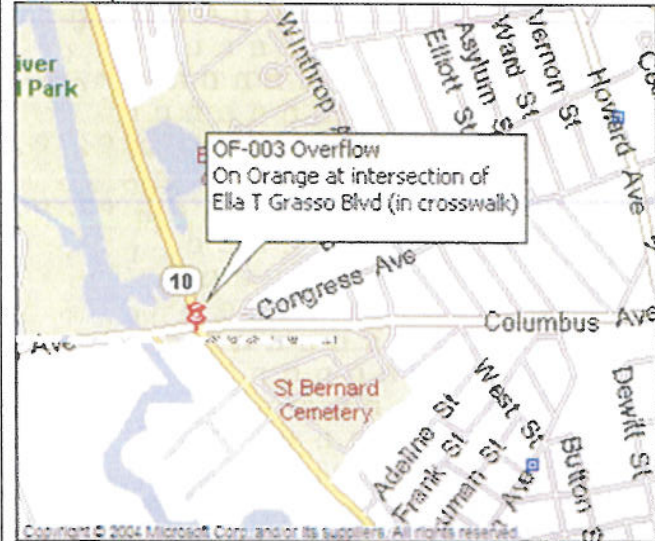


## SITE INVESTIGATION

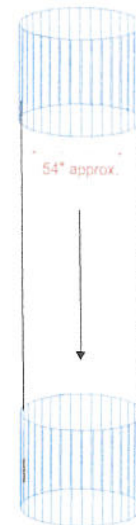
Project: New Haven Temporary Flow Metering Study		Date: 5/23/12	Name: L. Radico
Manhole #: OF-003 Overflow	Pipe Diameter: 54" Approx.	Time: 11:40	Town: New Haven, CT
Address/Location: On Orange Avenue at the intersection of Ella T. Grasso Boulevard (in crosswalk)			
Latitude: N 41°17.843'		Longitude: W 72° 56.926'	Access: Drive
Safety: Standard CSE		Manhole Depth: 7'8"	
Gas Investigation: Good	Manhole Condition: Fair	Traffic: Police/Traffic control required	
Sensor Configuration: Pressure Depth, Doppler Velocity			

Site Comments:	
Silt: None	
Depth: 2.0"	Velocity: No flow/Standing water

Area Map



Detail Map





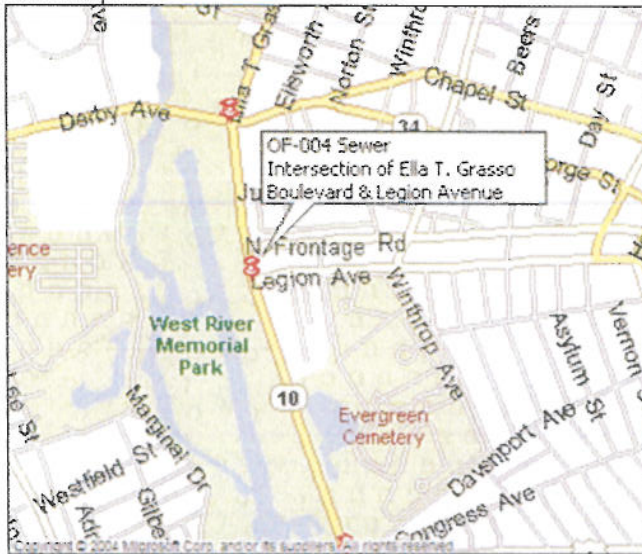


## SITE INVESTIGATION

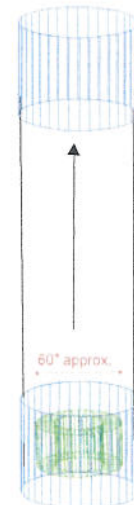
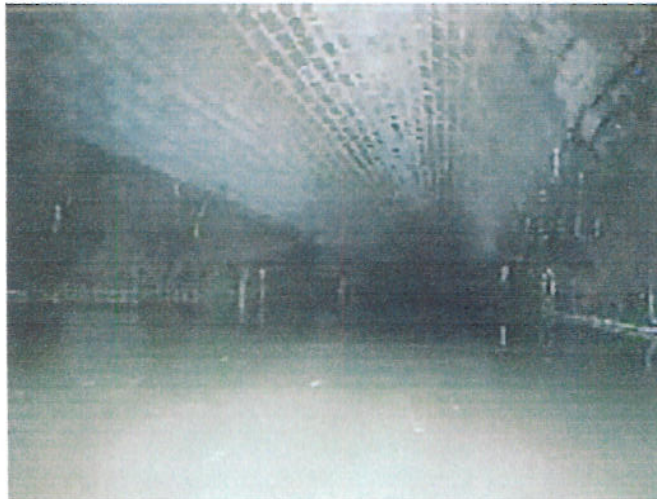
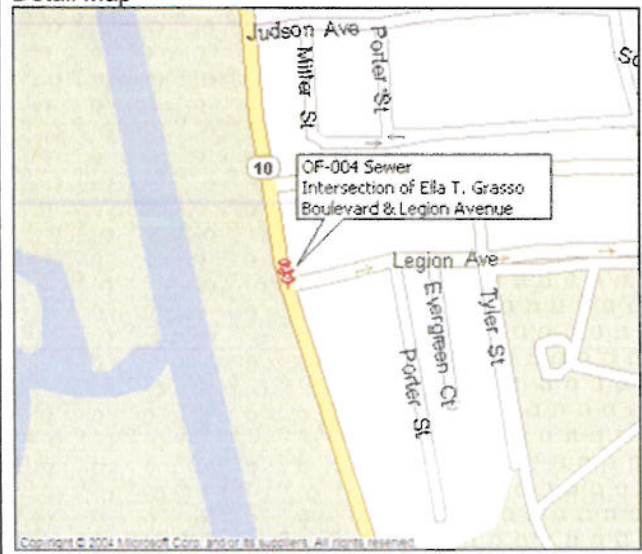
Project: New Haven Temporary Flow Metering Study	Date: 5/24/12	Name: L. Radico
Manhole #: OF-004 Sewer	Pipe Diameter: 60" approx.	Time: 12:15
Address/Location: Intersection of Ella T. Grasso Boulevard & Legion Avenue		
Latitude: N 41°17.337'	Longitude: W 72° 57.154'	Access: Drive
Safety: Standard CSE, Chest waders needed	Manhole Depth: 10'9"	
Gas Investigation: Good	Manhole Condition: Fair	Traffic: Police/Traffic control required
Sensor Configuration: Pressure Depth, Doppler Velocity		

Site Comments: Site should be suitable for metering.	
Silt: 8" hard & soft	
Depth: 24.25"	Velocity: 2.14 fps

Area Map



Detail Map





## SITE INVESTIGATION

Project: New Haven Temporary Flow Metering Study		Date: 5/24/12	Name: L. Radico
Manhole #: OF-004 Overflow	Pipe Diameter: 37.5" x 60 " approx.	Time: 13:25	Town: New Haven, CT
Address/Location: Ella T. Grasso Boulevard (20 yds. north of Legion Avenue)			
Latitude: N 41°18.340'		Longitude: W 72° 57.155'	Access: Drive
Safety: Standard CSE		Manhole Depth: 10'	
Gas Investigation: Good	Manhole Condition: Fair	Traffic: Police/Traffic control required	
Sensor Configuration: Pressure Depth, Doppler Velocity			

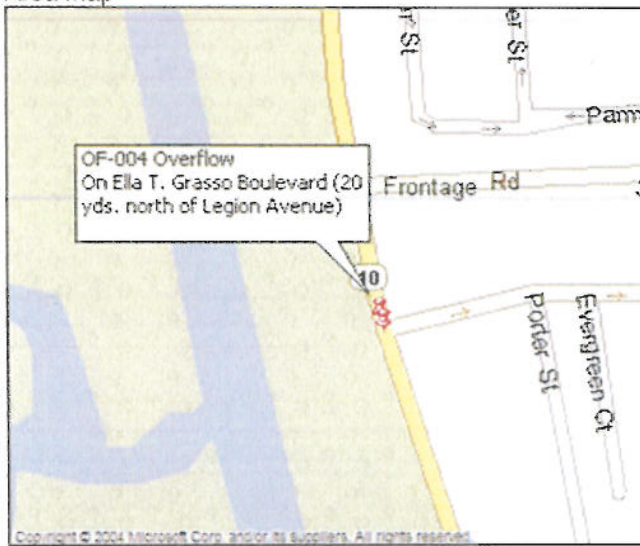
Site Comments: Site is suitable for metering.

Silt: None

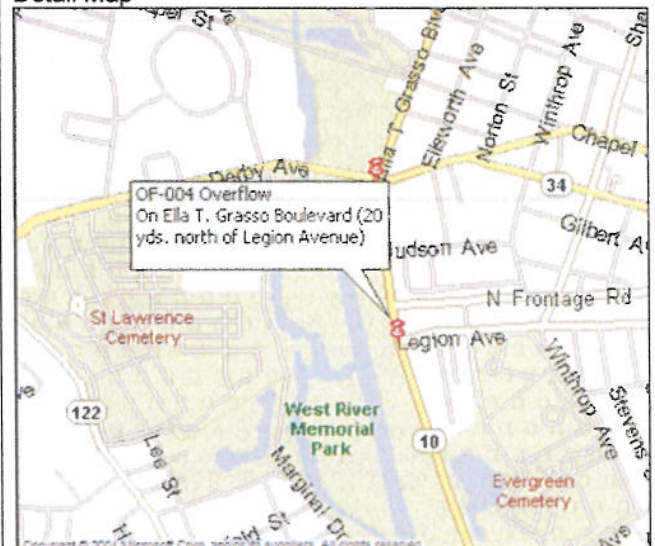
Depth: Dry Pipe

Velocity: Dry Pipe

Area Map



Detail Map

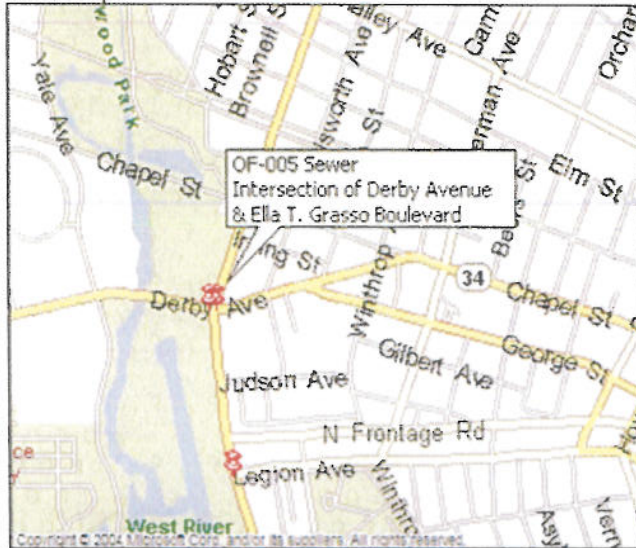


## SITE INVESTIGATION

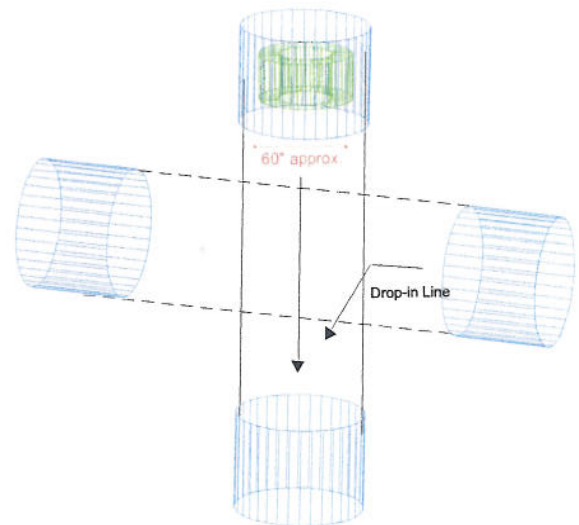
Project: New Haven Temporary Flow Metering Study		Date: 5/23/12	Name: L. Radico
Manhole #: OF-005 Sewer	Pipe Diameter: 60" approx.	Time: 13:35	Town: New Haven, CT
Address/Location: Intersection of Derby Avenue & Ella T. Grasso Boulevard			
Latitude: N 41°18.606'		Longitude: W 72° 57.195'	Access: Drive
Safety: Standard CSE		Manhole Depth: 14'	
Gas Investigation: Good	Manhole Condition: Fair	Traffic: Police/Traffic control required	
Sensor Configuration: Pressure Depth, Doppler Velocity			

Site Comments: Site is suitable for metering.	
Silt: 2"	
Depth: 24"	Velocity: 0.97 fps

Area Map



Detail Map





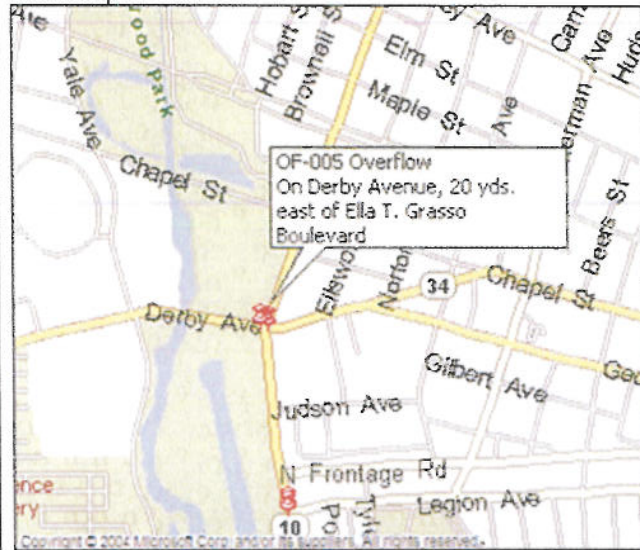


## SITE INVESTIGATION

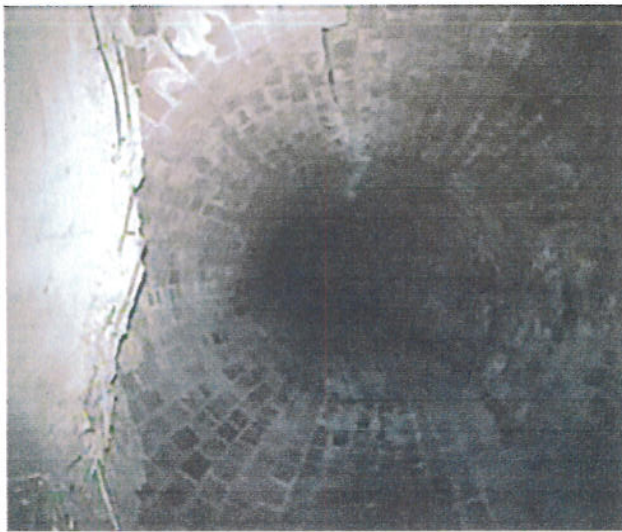
Project: New Haven Temporary Flow Metering Study		Date: 5/24/12	Name: L. Radico
Manhole #: OF-005 Overflow	Pipe Diameter: 48" approx.	Time: 9:25	Town: New Haven, CT
Address/Location: On Derby Avenue, 20 yds. east of Ella T. Grasso Boulevard			
Latitude: N 41°18.606'		Longitude: W 72° 57.232'	Access: Drive
Safety: Standard CSE		Manhole Depth: 8'2"	
Gas Investigation: Good	Manhole Condition: Fair	Traffic: Police/Traffic control required	
Sensor Configuration: Pressure Depth, Doppler Velocity			

Site Comments: Site is suitable for metering.	
Silt: None	
Depth: Dry pipe	Velocity: Dry pipe

**Area Map**



**Detail Map**

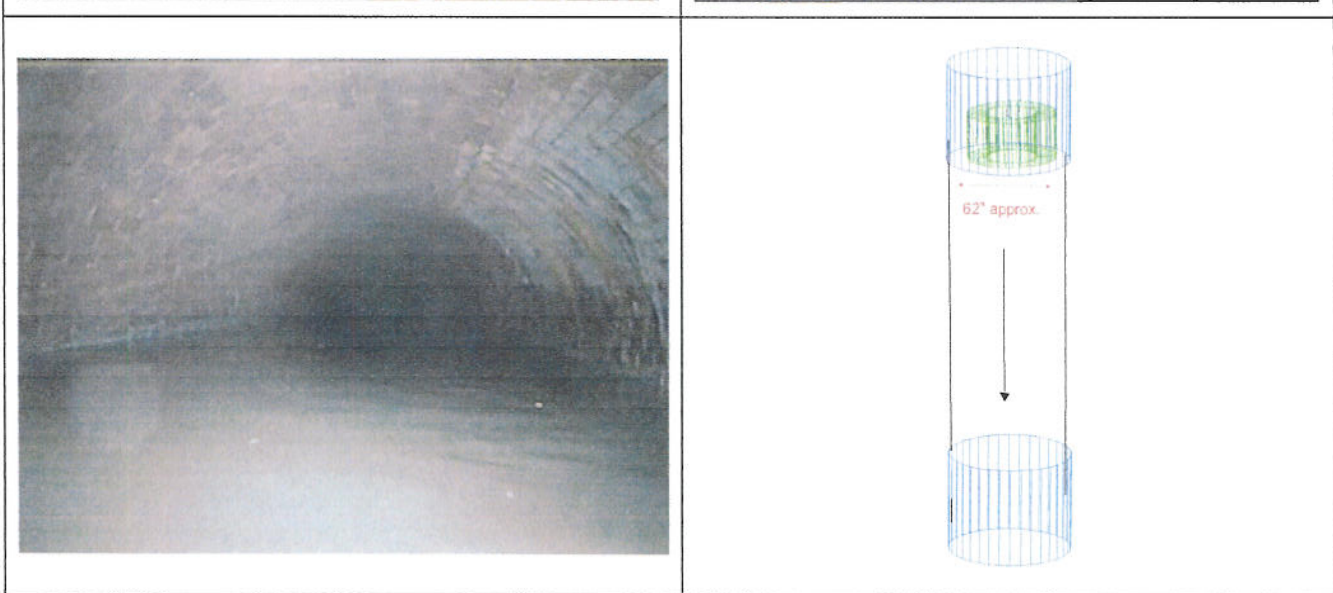
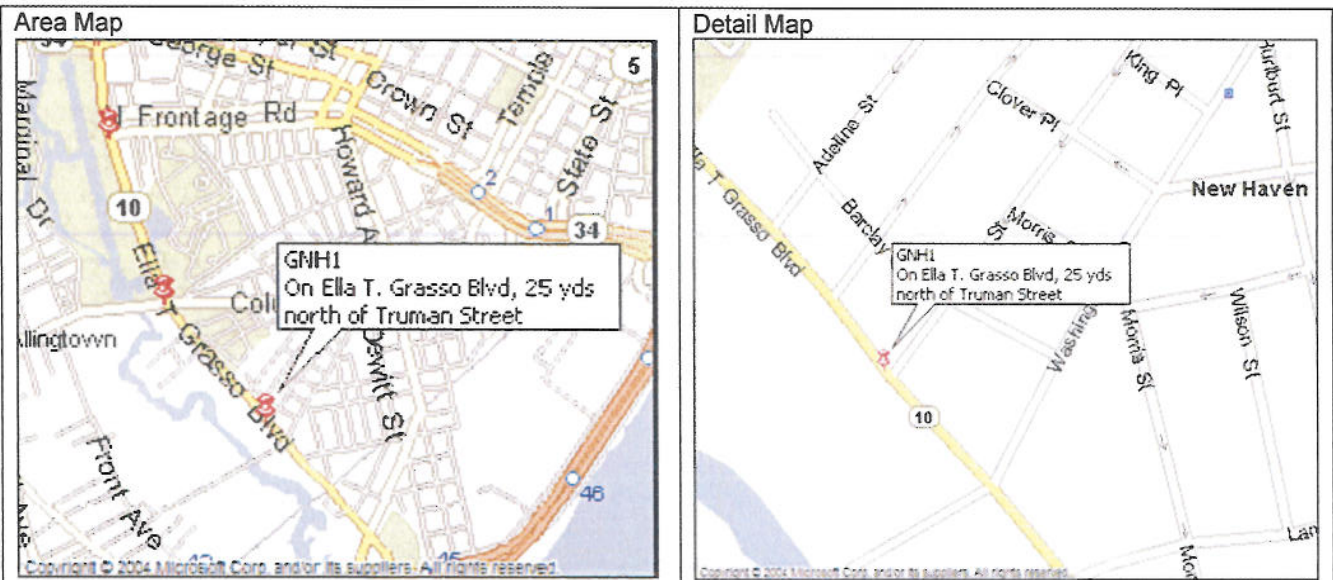




## SITE INVESTIGATION

Project: New Haven Temporary Flow Metering Study		Date: 5/24/12	Name: L. Radico
Manhole #: Truman Tank GNH1	Pipe Diameter: Approx. 62"	Time: 14:20	Town: New Haven, CT
Address/Location: On Ella T. Grasso Blvd, 25 yds north of Truman Street			
Latitude: N 41°17.495'		Longitude: W 72° 56.536'	Access: Drive
Safety: Standard CSE		Manhole Depth: 13'9"	
Gas Investigation: Good	Manhole Condition: Fair	Traffic: Police/Traffic control required	
Sensor Configuration: Pressure Depth, Doppler Velocity			

Site Comments: Evidence of surcharge	
Silt: 15" hard	
Depth: 28"	Velocity: 2.48 fps



## SITE INVESTIGATION

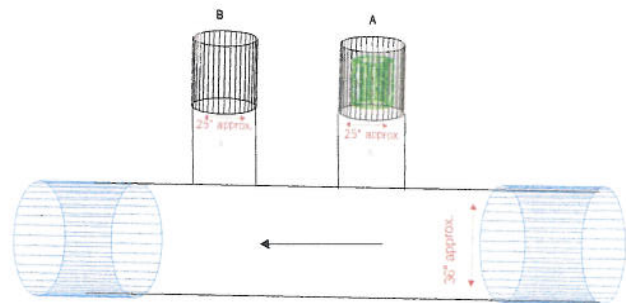
Project: New Haven Temporary Flow Metering Study		Date: 5/24/12	Name: L. Radico
Manhole #: OF-006 Overflow A	Pipe Diameter: 25"	Time: 10:30	Town: New Haven, CT
Address/Location: On Whalley Avenue, 30 yds from Fitch Street			
Latitude: N 41°19.507'		Longitude: W 72° 57.439'	Access: Drive
Safety: Standard CSE		Manhole Depth: 5' 11"	
Gas Investigation: Good	Manhole Condition: Good	Traffic: Police/Traffic control required	
Sensor Configuration:			

Site Comments: Site is suitable for metering.	
Silt: 7"	
Depth: 10.5"	Velocity: No flow/Standing

Area Map



Detail Map



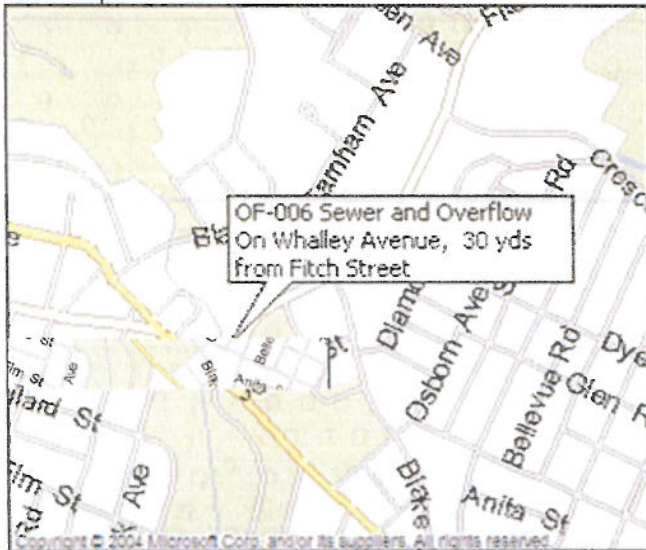


## SITE INVESTIGATION

Project: New Haven Temporary Flow Metering Study		Date: 5/24/12	Name: L. Radico
Manhole #: OF-006 Overflow B	Pipe Diameter: 25" approx.	Time: 10:30	Town: New Haven, CT
Address/Location: On Whalley Avenue, 30 yds from Fitch Street			
Latitude: N 41°19.507'		Longitude: W 72° 57.439'	Access: Drive
Safety: Standard CSE		Manhole Depth: 5' 11"	
Gas Investigation: Good	Manhole Condition: Good	Traffic: Police/Traffic control required	
Sensor Configuration:			

Site Comments: Site is suitable for metering.	
Silt: 8"	
Depth: 11"	Velocity: No flow/Standing

Area Map



Detail Map

